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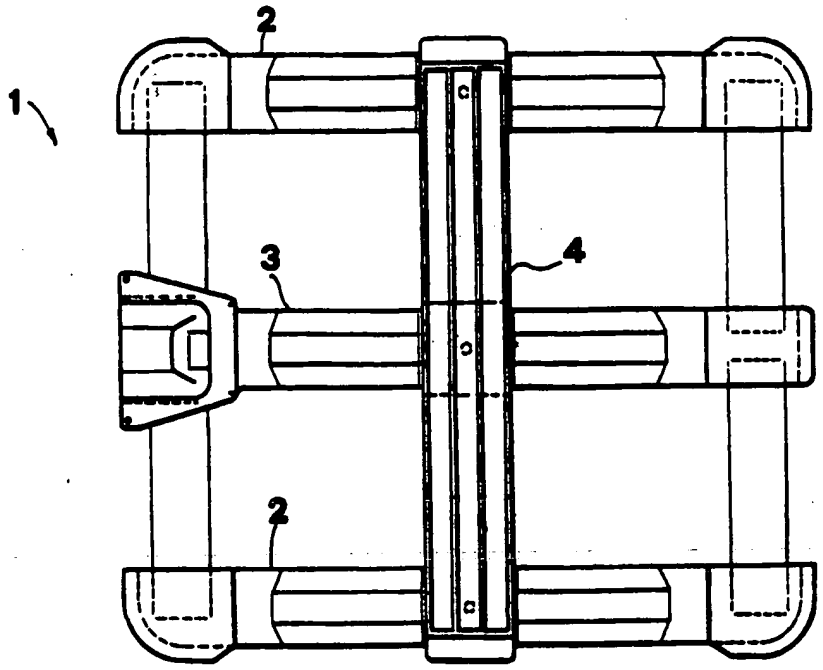
(54) Title: PLASTICS MATERIAL MODULAR PALLET



(57) Abstract

A plastics material modular pallet comprises a plurality of supporting elements (2, 3), operatively coupled to one another by at least a further element (4) cross arranged with respect to said supporting elements, the cross arranged element including a plurality of recesses (11) for engaging therein one or more structural reinforcement elements.

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Description

PLASTICS MATERIAL MODULAR PALLET

BACKGROUND OF THE INVENTION

The present invention relates to a plastics material modular pallet.

As is known, in the industrial shipment field are broadly used pallets for bearing and/or supporting any types of loads such as parts of apparatus, half-finished products, cisterns or tanks and so on.

Prior pallets are conventionally made of wood, steel or plastics materials. In particular, plastics materials are very advantageous owing to their small weight, strength and atmospheric agent resistance properties and are quickly replacing the other mentioned materials. This replacement relates specifically the pallets provided for supporting and/or bearing cisterns or tanks for carrying different types of liquids, up to a specific gravity of about 1.9 Kg/dm^3.

While the above mentioned prior pallets solve the indicated technical problem, they are affected by the following disadvantages.

The wood or steel pallets are affected by a lot of drawbacks directly deriving from the material forming said pallets. In particular, wood pallets can be easily spoiled under the effect of atmospheric agents, and their mechanical strength characteristics are susceptible to greatly change in the time; the steel pallets, on the other hand, have a greater strength, which, however, is related to a significative weight increase; moreover, steel pallets

must be properly protected against corrosion.

Plastics material pallets would allow to overcome the main problems of the other material pallets and, since plastics material pallets can be constructed with a modular construction, they would be very practical in use.

However, prior plastics material pallets are also affected by two types of drawbacks.

The first is the practical impossibility of changing the pallet strength depending on the load. In fact, for example, the cisterns supported by said pallets can be filled with greatly different specific gravity liquids: i.e. specific gravity values from about 1 Kg/dm^3 for water to about 1.4 Kg/dm^3 for food liquids and up to about 1.9 Kg/dm^3 for special liquids used in some industrial processes.

It should be apparent that, as the liquid changes, also the strength properties of the pallet would be changed, thereby it would be necessary to use pallets of different size, depending on the load to be supported, or it would be required to use pallets designed for supporting, the load capability of the cistern being the same, the liquid having the greatest specific gravity.

In both cases, the pallet cost would greatly increase.

The further drawback of prior plastics material pallets for supporting cisterns is the corrosion in the time of the collecting tray thereof. The latter, which is conventionally arranged under the faucet of the cistern, is provided for collecting possible liquid leakages occurring as the stored liquid is poured, which leakages, in the case of the

noxious liquid, would be very dangerous.

In particular, since the collecting tray is made of steel, it is much or more corroded in the time: thus, it is necessary to replace the overall pallet in order to allow an efficient collection, since the tray cannot be separated from the pallet. Thus, in this case too, the involved cost for the user would inevitably increase.

SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to overcome the above disclosed drawbacks of the prior art.

To achieve the above aim, the invention provides a plastics material modular pallet, very practical in operation, efficient, constructionally simple, which can be fitted to any load requirements and used without any maintenance requirements.

Briefly, according to the invention, the above aim is achieved by a plastic material modular pallet comprising a plurality of supporting elements, operatively coupled to one another by at least a further element cross arranged with respect to said supporting element, said cross arranged element including a plurality of recesses for engaging therein one or more structural reinforcement elements.

The plastics material modular pallet according to the invention is characterized by the characteristics disclosed in Claim 1.

The plastics material modular pallet according to the invention provides the following advantages.

Each pallet according to the invention can

be fitted to a lot of different load requirements, by quick and simple fitting operations, which can be easily carried out by the pallet user.

A further advantage is that the subject pallet is practically free of any maintenance requirements, and, moreover, it would not be necessary to replace the pallets because of the disclosed tray corrosion problems, with a self-evident reduction of the operation cost.

Finally, the individual components of the pallet according to the invention can be easily made by known making method on conventional existing pallet making lines, with very small modifications to the existing systems. Thus, the pallet making cost can be compared to that of a prior pallet, whereas the operating cost is much smaller.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics, advantages and constructional details of the plastics material modular pallet according to the present invention will become more apparent from the following detailed disclosure, with reference to the accompanying drawings, in which a preferred embodiment of the invention is shown by way of an indicative but not limitative example.

In the drawings:

Figure 1 is a top plan view of the plastics material modular pallet according to the invention;

Figure 2 is a side view, as partially cross-sectioned, of the pallet shown in Figure 1;

Figure 3 is a further top plan view of a first elem nt included in the pallet shown in Figure

1;

Figure 4 is a front view, as partially cross-sectioned of the element shown in Figure 3;

Figure 5 is a further top plan view of a second element included in the pallet shown in Figure 1;

Figure 6 is a front view, as partially cross-sectioned, of the element shown in Figure 5;

Figure 6a is a cross-sectioned side view of the element shown in Figure 5;

Figure 7 is a top plan view of a third element included in the pallet shown in Figure 1; and

Figure 8 is a partially cross-sectioned front view of the element shown in Figure 7.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the number references of the above disclosed figures, the plastics material modular pallet 1 according to the invention comprises a pair of outer elements or longitudinal members 2, a central element or longitudinal member 3, and a further element cross-arranged with respect to the preceding elements, or cross-member 4.

The outer longitudinal members 2 are provided, at each end portion thereof, with a prismatic recess 5 for engaging therein and anti-tilting tie-member, whereas, at the middle thereof a female recess 6 is provided which, as it will be disclosed more apparent hereinafter, will allow the tie member 4 to b easily fastened.

The central longitudinal member 3 is provided, at each end portion thereof, with a pair of

prismatic recesses 7, also provided for receiving therein the end portions of said anti-tilting tie members, whereas, at the middle thereof, is provided a further female recess or coupling element 8, identical to the disclosed female coupling element 6, and having the same function.

On one end, above one of said pair of recesses 7, a collecting tray 9 is provided, said collecting tray being made of the same plastics material used for making the pallet 1 according to the invention, and, accordingly, being devoid of any corrosion problems.

The tie or cross member 4 is arranged perpendicular to the above disclosed longitudinal members 2, 3 which are parallel to one another. Said cross-member 4 is provided at the top thereof, through the overall length thereof, with three C-shaped recesses 11 for engaging therein a corresponding number of metal reinforcement elements designed for modifying the value of the maximum load allowable for the overall pallet 1.

At the bottom thereof, the cross member 4 is provided with three attachment or male elements, of hook shape, 10 which, upon engaging in the female coupling elements 6, 8, will firmly fasten the cross-member 4 to the longitudinal members 2, 3. As shown, through the outer longitudinal members 2, the central longitudinal member 3, as well as through the crossmember 4, a plurality of holes 12 are provided, said holes being specifically designed for receiving therein a corresponding self-threading screw in order to fast n on the top of the pallet 1 a metal sheet panel, providing the bearing base for the load to be

supported.

In this connection it should be apparent that the shape and size of the several elements constituting the plastics material modular pallet according to the invention can be changed depending on requirements, without departing from the scope of the present invention.

The assembling and operation of the plastics material modular pallet 1 according to the present invention can be easily deduced from the preceding disclosure.

Actually, after having arranged the longitudinal members 2, 3 in a parallel relationship with respect to one another, and after having assembled in the provided recesses 5, 7 the anti-tilting tie or cross members, the cross-member 4 will be fastened by engaging the three hook male elements 10 in the female recesses 6, 8, after having suitably arranged them on the outer longitudinal members 2 and central longitudinal member 3, and, finally, in said recesses 11 a set number of reinforcement elements will be engaged.

A metal sheet panel is then fastened by self-threading screws engaged in said holes 12, to the thus assembled pallet 1.

In this connection it should be pointed out that, upon assembling, the pallet 1 cannot be manually disassembled, but, for disassembling it, it would be necessary to use suitable disassembling tools for disengaging the cross member 4 from the longitudinal members 2, 3.

The thus made pallet 1, with the addition of a metal cage fastened by the same self-threading

screws to said pallet, can support, for example, a liquid filled cistern or tank: in this connection it should be pointed out that it would be possible to modify the maximum load which can be applied on said pallet, by removing the metal sheet panel and modifying the number of metal reinforcements provided in said recesses 11 on said cross-member 4.

The, the pallet 1 could be stiffened or reinforced again, depending on the amount of liquid filled in said cistern, and depending on the liquid specific gravity.

As the pallet 1 is used for supporting different elements, then it would be still possible to modify the maximum strength values of said pallet, by removing or adding said metal reinforcement elements, which operation could be easily and quickly carried out.

CLAIMS

1 A plastics material modular pallet, comprising a plurality of supporting elements (2, 3), operatively coupled to one another by at least a further element (4) cross-arranged with respect to said supporting elements, characterized in that said cross-arranged element (4) comprises a plurality of recesses (11) for engaging therein one or more structural reinforcement elements.

2. A plastics material modular pallet according to Claim 1, characterized in that said supporting elements (2, 3) comprise two outer longitudinal elements (2) and a central longitudinal element (3), each having, at a middle portion thereof, a female coupling element (6, 8) designed for engaging therein a corresponding male coupling element (10) provided on the bottom of said cross arranged element or cross member (4).

3. A plastics material modular pallet according to the preceding claims, characterized in that said outer longitudinal elements (2) are provided with a plurality of holes (12) and, at each end portion thereof, with a recess (5) designed for engaging therein a corresponding end portion of a tie member.

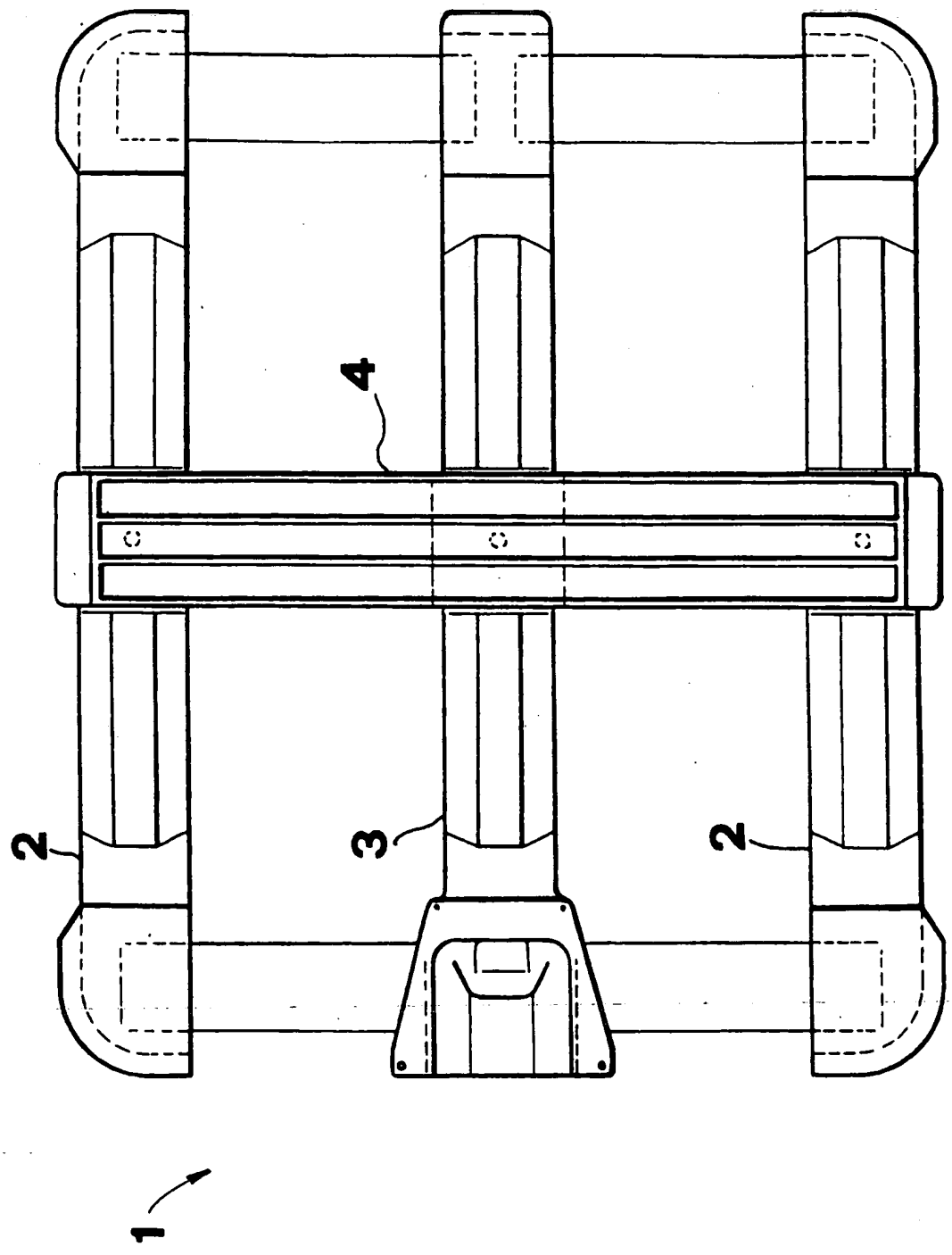
4. A plastics material modular pallet according to one or more of the preceding claims, characterized in that said central longitudinal element (3) comprises a plurality of holes (12) and. at each end thereof, a pair of recesses (7), each said recess (7) being designed for receiving the corresponding end portions of two tie members, whereas

on an end portion a plastics material tray (9) is provided.

5. A plastics material modular pallet according to one or more of the preceding claims, characterized in that said cross-member (4) is provided with a plurality of holes (12) and, at the bottom thereof, with three hook male connecting elements (10) and, at the top thereof, with three C-shape recesses (11) designed for engaging therein up to three structural reinforcement elements.

6. A plastics material modular pallet, characterized in that said pallet comprises a plurality of elements specifically contoured, arranged and associated, and as broadly disclosed and illustrated and for the intended objects.

FIG. 1



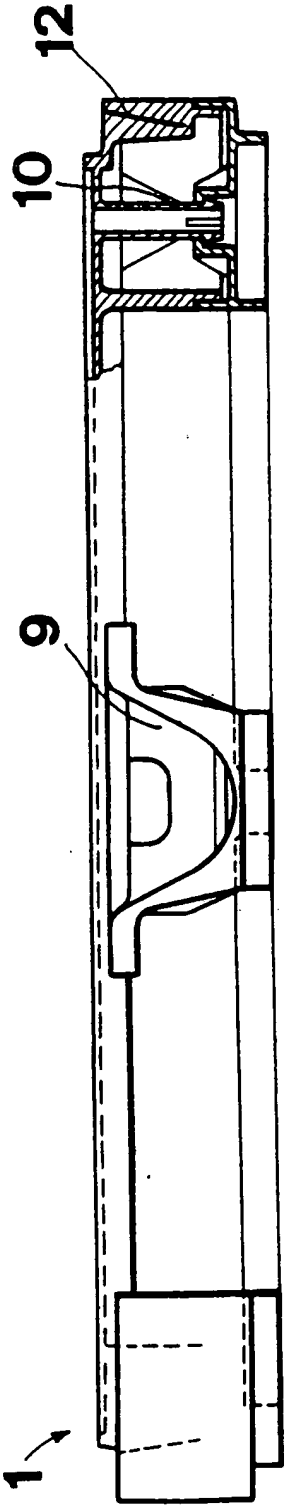


FIG. 2

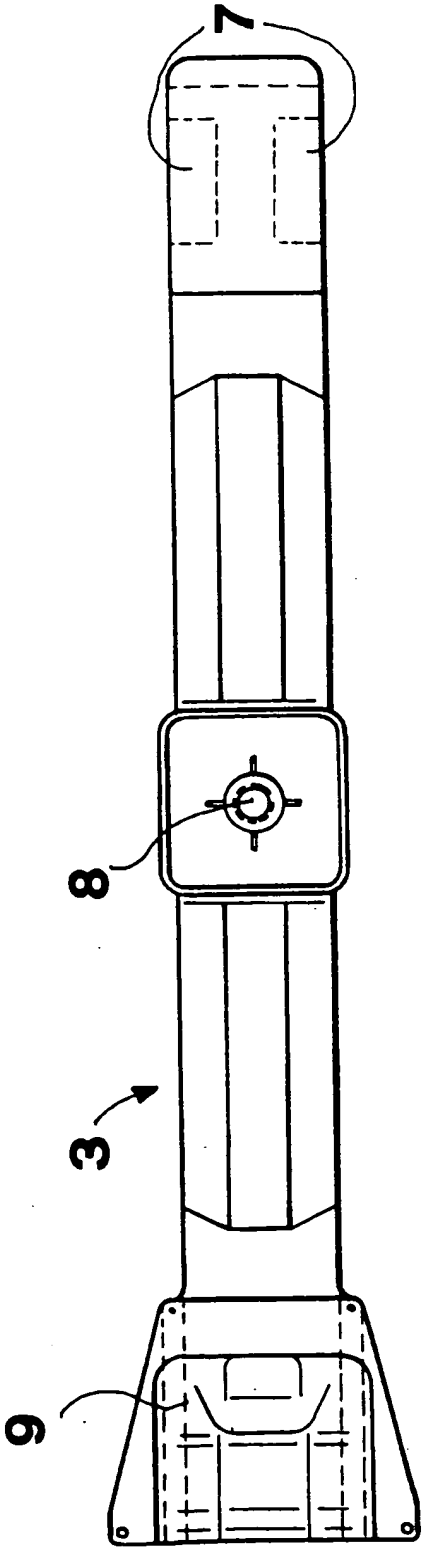


FIG. 3

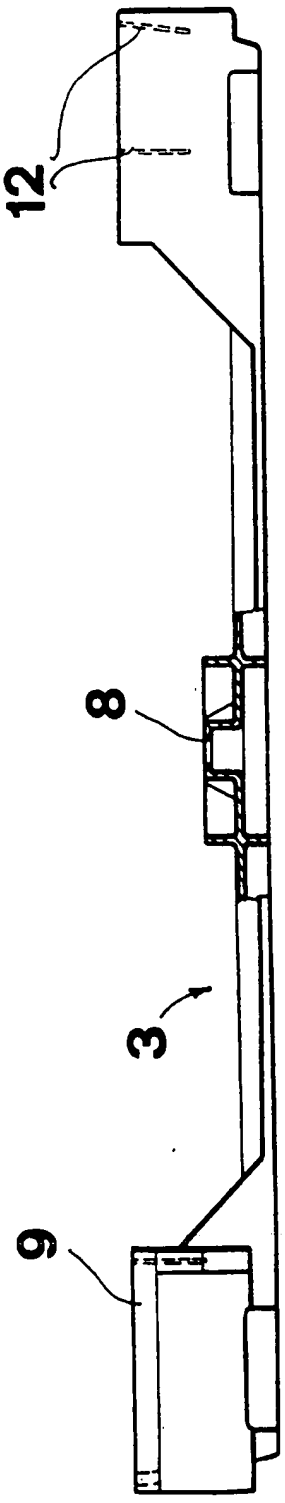


FIG. 4

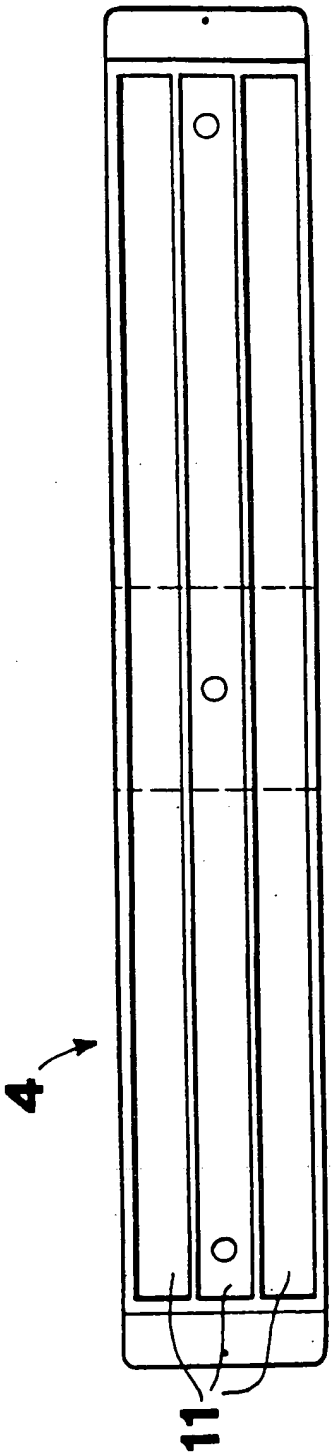


FIG. 5

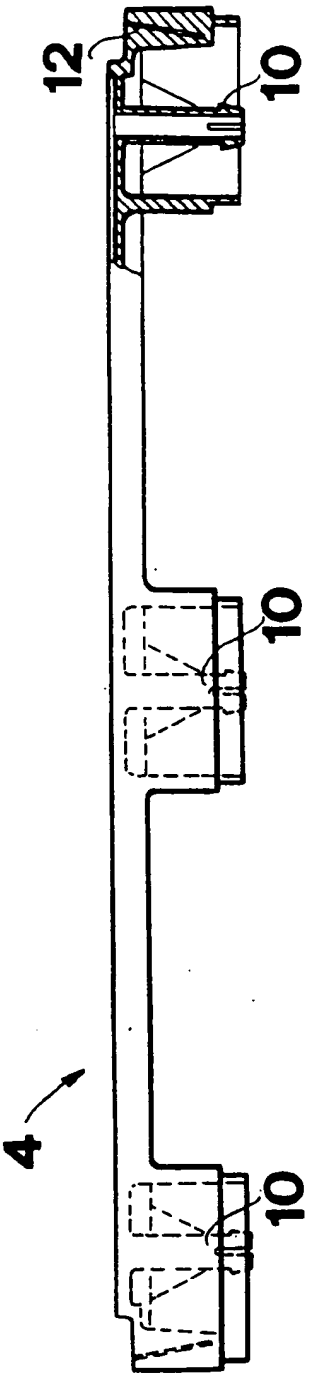


FIG. 6

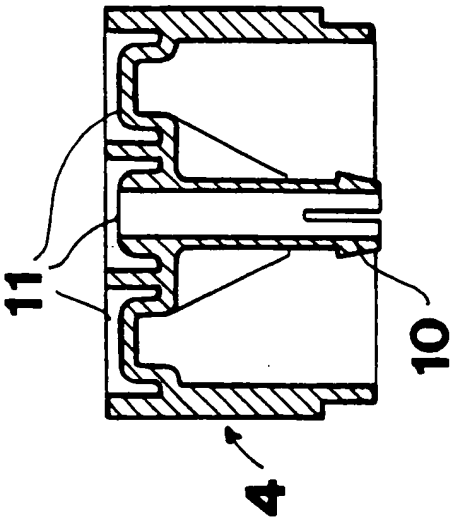


FIG. 6a

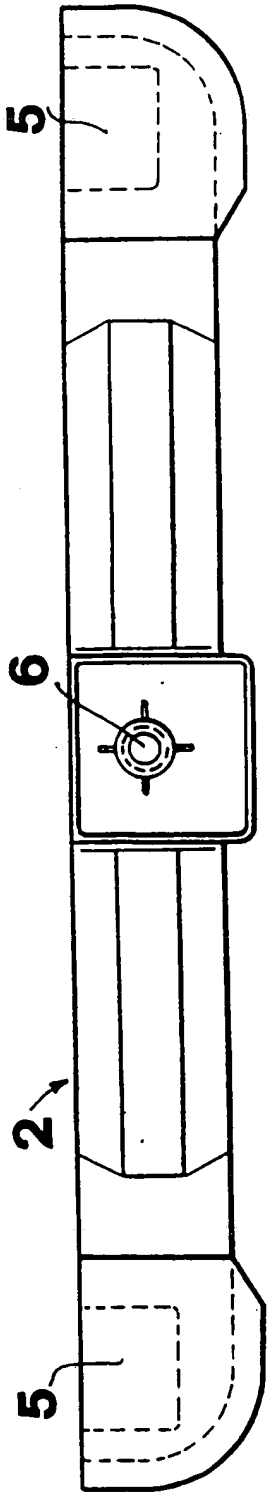


FIG. 7

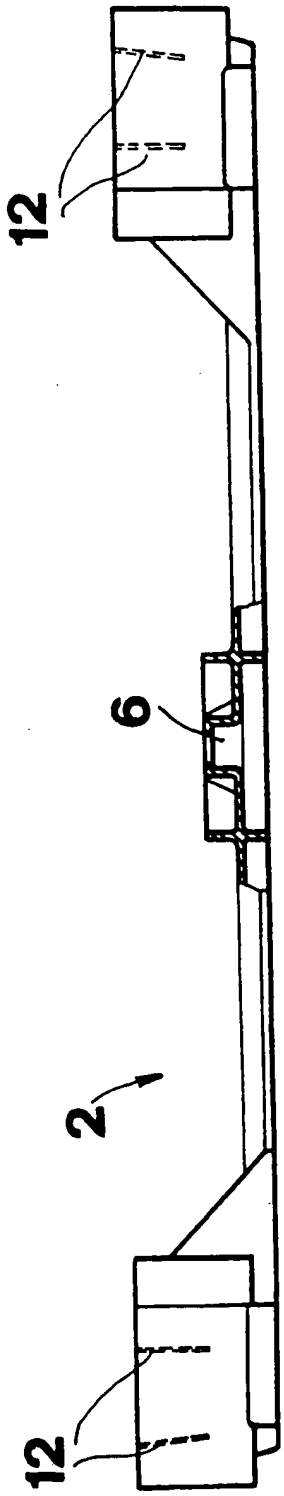


FIG. 8

INTERNATIONAL SEARCH REPORT

Interna al Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B65D19/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 456 189 A (BELLE ISLE) 10 October 1995	1
A	see column 2, line 39 - column 4, line 12; figures 1-7	2,3

Y	US 4 735 154 A (HEMERY) 5 April 1988 see column 1, line 63 - column 3, line 12; figure 1	1

A	EP 0 649 794 A (COMPAGNIE PLASTIC OMNIUM) 26 April 1995 see column 9, line 3 - line 31; figures 1,6	1

A	DE 80 06 585 U (MAUSER-WERKE) 12 June 1980 see page 7, line 1 - page 8, line 4; figures 1,2	3-5

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
16 April 1999 (16.04.99)	26 April 1999 (26.04.99)

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 94 12 606 U (SCHNEIDER) 3 November 1994 see page 8, line 27 - line 34; figures 1,2,6	4
A	DE 91 03 462 U (AEPFELBACH) 13 June 1991 see page 10, line 1 - line 28; figure 3	5

INTERNATIONAL SEARCH REPORT

Ir. .ational application No.
PCT/IT 98/00353

Box I Observations where certain claims were f und unsearchabl (C ntinuati n of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
Please see PCT rule 6.2 (a).

2. [ ] Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[ ] No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Interna il Application No
PCT/ T 98/00353

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